

Lunar Excavator Validation, Phase I

Completed Technology Project (2009 - 2009)



Project Introduction

Energid Technologies proposes to create a tool for simulation-based verification of lunar excavator designs. Energid will combine the best of 1) automatic control system generation from computer aided design (CAD) models, 2) rapid validation of complex mechanism designs, and 3) detailed simulation models of the lunar environment, including regolith, dust, temperature, remote supervision, and communication latency to create a system of high value to NASA. Energid has previously developed unique algorithms for controlling and simulating complex robotic mechanisms automatically from just a CAD description. These algorithms will be leveraged to create a system to quickly test excavation systems by generating optimal control algorithms for use in studies. Energid has also developed high-fidelity real-time physics-based simulation algorithms that include models of internal forces and the forces produced when a mechanism interacts with the outside world. This existing capability will be combined with an innovative organization for simulation algorithms, new regolith simulation methods, and a unique control and study architecture to make a powerful tool with the potential to transform the way NASA verifies and compares excavator designs.

Primary U.S. Work Locations and Key Partners

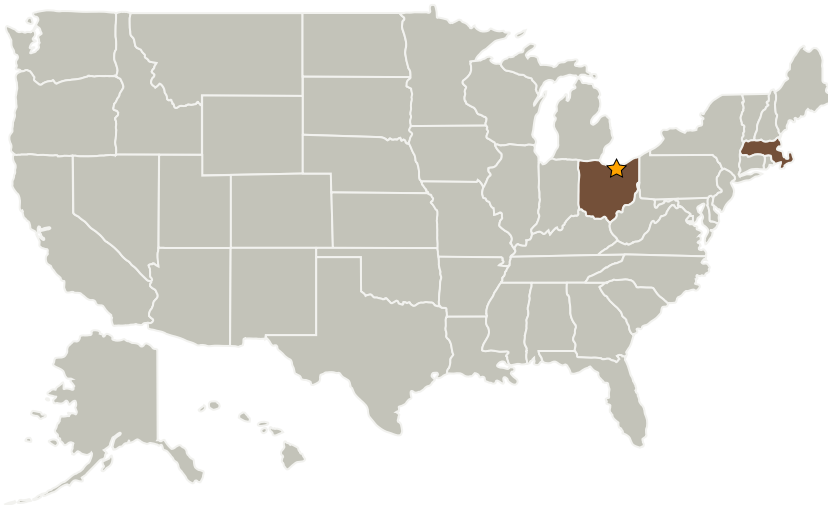
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Organizational
Responsibility**Responsible Mission
Directorate:**Space Technology Mission
Directorate (STMD)**Lead Center / Facility:**

Glenn Research Center (GRC)

Responsible Program:Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Energid Technologies	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations

Massachusetts	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.5 Mission Architecture, Systems Analysis and Concept Development
 - └ TX11.5.3 Tools and Methodologies for Vehicle or Concept Definition Activities